Land O'Lakes / Zambia
Title II Development Activity Program
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FY 2004 RESULTS REPORT

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Submitted by

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1.0 RESULTS REPORT

1.1 Annual Results

Land O' Lakes, Inc. /Zambia is implementing a PL480 Title II Development Assistance Program (DAP) with the aim of contributing to the reduction of food insecurity among rural communities in Zambia through dairy production and a warehouse receipt component for non-perishable crops. Since the DAP is only in its first year, and full proceeds from monetization were only received during August, 2004, it was not possible to commence full implementation and monitor results. However, during this period, Land O'Lakes, Inc./Zambia was implementing its Zambia Dairy Enterprise Initiative (ZDEI), which laid the technical foundation for the Title II program. A brief review of the results of this program is provided below.

1.1.1 Zambia Dairy Enterprise Initiative

The following results refer to the purposes, objectives and activities of the ZDEI, which closed out in September 2004, after a 3 year period.

The main program objective of the ZDEI was to contribute to USAID's SO1 *"Increased Sustainable Rural Incomes*", by focusing on 3 key technical areas of dairy development:

- **Raw Product Supply Improvement** - Increase smallholder raw milk quality and quantity.
- **Product Development/Improvement and Quality Assurance Systems** - Support for dairy processors to improve their output and quality, including the development of new, higher-value products
- **Industry-Led Promotion and Marketing Campaign** - Promote and support the dairy industry to develop sustainable marketing tools that can be used to capture consumer attention.

Raw Product Supply Improvement

The ZDEI, through the raw product supply improvement component, assisted dairy producers to improve milk yields by improving animal nutrition. Efforts focused on improving forages and storage technologies and expanding the availability of feed and feed supplements in the local markets around milk collection centers (MCCs). Increased smallholder raw milk quality and quantity was the goal around which these efforts were directed. Focus was on increasing the capacities of the MCCs it helped to create to deliver additional services needed by smallholder dairy producers to achieve greater efficiency and market power.

<u>MCCs</u>

The objective of this technical area was to strengthen farm to market infrastructure by clustering producers for the efficient delivery of technical assistance and training so that

these producers could directly participate in the dairy market through the development of collection linkages through a demand driven process. This was intended to improve acess to lower cost inputs and improve cost efficiencies through group marketing efforts. Specifically the program was to establish Five (5) milk collection centers including the procurement, storage and distribution of cooling tanks and other equipment through market oriented loans.

Two MCCs are being established. The value of raw milk marketed by MCCs for the period under review was US$563,842 compared to US$214,240 the previous year. This value includes the value of raw milk marketed by milk collection centers established the previous year and have continued to receive support under the Title II program. 132,000US$ worth of dairy equipment has been procured.

Training of Smallholder farmers in Dairy Production

The program also sought to provide training to dairy producer groups and associations in dairy management and business skills; in the operation and business management of MCCs; and in raw milk quality control, testing, and handling.
The target of 200 new farmers trained under the GDA was far exceeded by 248. 93 new farmers were recorded as delivering milk to the ten (10) milk collection centres set up in the last year. The number of new farmers delivering to new centers was not met as collection centers were still being established by the program due to the termination of the ZATAC Limited's contract and late commencement of program activities related to establishment of the 5 new centers set for the program extension.
108 farmers received training in technical production skills while 10 farmers were provided the opportunity to visit Kenya to widen their knowledge of dairy production in the region.

Start up meetings were held with farmers at Nteme, Pelusa, and Pemba. Two of theses sites are currently constructing Milk Collection centres and delivering milk to Magoye and Monze respectively.

Land O' lakes, Inc. observes that many constraining factors that affect dairy productivity at Farm level are as a result of limited extension service. Working with the Golden valley Agricultural research Trust, the program has provided an opportunity to overcome this constraint to at least three milk collection centres over the last one year.

Strengthening of Producer groups

Another objective was to develop a mechanism to link groups of small farmers with agribusinesses for technology transfer, delivery of services and quality improvements through price incentives. During the period under review, the total membership base increased by 448, bringing the total membership since inception of the program to 1,234. Of these, 1,127 were active members in that they participated in all programs of MCCs including training sessions and meetings.

Milk sales to MCCs

The participating farmers earned, on average, US$ 120 more than they earned in the previous year as a result of program activities.

The total milk collected at the MCCs over the year increased by 1,572,212 liters. This does not include milk consumed at the farm level and quantities sold directly without passing through MCCs. Therefore production by farmers is much higher than is being reported.

Increase in overall producer group milk production and profit margins

Year	Total milk produced	Profit margins from milk sales
October 1, 2002 – September 30 2003	1,197,228 Liters	0.07 US$
October 1, 2003 – September 30 2004	2,769,440 Liters	0.10 US$
% Increase	56%	30%

Product Development/Improvement and Quality Assurance Systems

The ZDEI provided assistance to Small and Medium Enterprise (SME) processors in quality improvements and new product development. The primary focus was to assist locally-owned processors to improve their output and quality, including the development of new, higher value products. Various levels of assistance were offered in the areas of: product fortification, product design, business and financial planning, and quality control.

During the period of October 2003 to September 2004, Land O' Lakes provided STTA to processors for product development and improvement, packaging improvement, and improvement in general quality and hygiene standards. The two primary interventions during this period involved two technical visits by experts in processing and product development.

Technical advice was provided to seven processors in various aspects related to product development and quality standards. Two beneficiaries of this assistance (Finta Dairies and Dairy King) have since made significant investments to their plant capacities and product development.

Industry-Led Promotion and Marketing Campaign

Increasing per capita milk consumption in Zambia was a paramount objective of the ZDEI. Accomplishing this objective involved Land O'Lakes assistance to facilitate the formation of a dairy promotion association that would take the lead in promoting Zambian dairy products to target consumer groups; including an educational campaign to specific disadvantaged groups that focuses on the nutritional benefits of milk and dairy products.

Promotional & educational campaigns

Land O'Lakes in partnership with the dairy processors' association enlisted the services of promotional and experiential marketing organizations to conduct regional and national promotional activities to promote the nutritional benefits of consuming milk and dairy products. Activities included media promotions, dairy month campaigns, event sponsored activities and sports sponsorships.

Media Campaign

Strategic media promotional campaigns were initiated to create top of mind awareness of the nutritional benefits of consumption. The promotion involved the airing of electronic ads on radio and T.V highlighting specific nutritional benefits of consuming milk and dairy products. Media selection criteria were based on reach, listener frequency and coverage. Target groups were all consumers countrywide. The media promotions were scheduled to run from December 2003 – Mid January 2004 to capture consumers during peak season and influence the buying patterns of the targeted consumers.

These promotional and marketing campaigns resulted in the improvements in output of targeted dairy processors as illustrated in the table below;

Volume sale output from processors

Processor	**Products considered**	**Daily Processing Capacity**	**Annual % increase**
Parmalat	Fresh milk; Long Life milk; Lacto (sour milk); Butter; Cheese	120,000	0.3
Dairy King	Fresh milk; Lacto (sour milk); drinking yoghurt (yoghurt drink)	1000	16.2
Diamondale	Fresh milk; Lacto (sour milk); Flavoured Milk; Cheese; Butter	10,000	27.9
Kaposhi	Various cheese products	5000	8.5

1.2 Monitoring and Evaluation

1.2.1 Title II Development Assistance Program

While the program did not achieve measurable results, it set the stage for implementation by carrying out the following M&E related activities. Several of these activities were set forth as conditions for TA approval.

1. **Baseline Survey:** The Survey was conducted in the areas of program implementation (*Summary provided as Appendix A*). The Survey sought to provide:
   - a precise understanding of the socio-economic status and degree of vulnerability of potential program participants
   - indicate which sectors of the population should be targeted by the DAP program
   - recommend how often indicators should be measured
   - a set of achievable target values for each indicator based on recommended frequency of data collection.

   (The final Baseline Survey Report will be submitted to the Office of Food for Peace and USAID/Lusaka by November 15, 2004.)

2. **Food Security Indicators:** On recommendation by FFP that the program should measure its impact on food security, particularly food access, of insecure households,[1] a set of food security impact indicators was developed to measure the program's contribution to the reduction of food insecurity among vulnerable populations. (*Appendix B*)

3. **Performance Management Plan:** A PMP was also developed during the year under review to track the progress that the program would be making toward achieving its set objectives. This plan contains the indicators that will measure performance at each level of the program's hierarchy of objectives, their data sources, and the quality of data available and responsibilities for collection and analysis of the data. Some of these indicators will be reported on as part of the IPTT, while others will provide data for management purposes only.

4. **Results Framework:** The program's results framework, which, in line with USAID SO5, was addressing economic growth, was reviewed and has been revised to be more in line with USAID/FFP's Strategic Objective *(Included in PMP, Appendix C).*

1.2.1.1 Indicator Performance Tracking Table:

Based on recommendations from FFP, the IPTT was reviewed to ensure that indicators will measure food security impacts, particularly in the arena of food access, as per those listed within FFP's Proposed FY04-08 at the Strategic Objective level. Indicators were revised to ensure that they are more results-oriented and track the program's progress towards addressing the needs of vulnerable populations[2].

[1] Addendum to DAP, Page 10
[2] Addendum to DAP, Page 9

LAND O'LAKES, INC / ZAMBIA INDICATOR PERFORMANCE TRACKING TABLE

Indicator [3]	Base-line	FY 1 Target	FY 1 Achieved	FY 1 Achieved vs. Target	FY 2 Target *	FY 2 Achieved	FY 2 % Achieved vs. Target	FY 3 Target *(Mid-term)	FY 3 Achieved	FY 3 % Achieved vs. Target	FY 4 Target *	FY 4 Achieved	FY 4 % Achieved vs. Target	FY 5 Target *	FY 5 Achieved	FY 5 % Achieved vs. Target	LOA Target	LOA Achieved
Goal (FFP/SO): Food Insecurity Among Vulnerable Populations reduced																		
G1. Number of months of adequate staple provisions	9.4 Months							10.0 Months									10.6 Months	
G2. Percentage Increase in number of households having at least 3 meals a day	63%							73%									83%	
Strategic Objective : Increase incomes for Smallholder Farmers																		
SO1. Increase in average household income from dairy sales	$680 per annum per farmer							$748 per farmer per annum									$816 per farmer per annum	
SO2. Increase in average household income from warehousing system	0							5%									15%	
Intermediate Result 1 : Increased productivity of smallholder Dairy Farmers																		

[3] See Performance Management Plan for details of each Indicator

IR1.1 Percentage Increase in average milk produced by smallholder farmers	2750 liters per annum per farmer				20%			30%			40%			50%			50%	
IR1.2 Percent Increase in average yield of dairy cattle (liters per cow per day)	4 liters				6 Liters			8 Liters			10 Liters			12 Liters			12 Liters	
IR1.3 Number of smallholder farmers owning improved dairy cattle	0				250			250			250			250			1000	
IR1.4 Number of smallholder farmers trained	0				450			450			450			450			1800	
Intermediate Result 2: Improved Productivity of the Dairy Industry																		
IR2.1. Increase in value of milk sold by Milk Collection Centers	(000) 778 US$							(000) 855 US$						(000) 930 US$			(000) 930 US$	
IR2.2 Percentage Increase in volume of milk used by targeted Processors to produce dairy products	(000) 132.5 liters				10%			20%			25%			30%			30%	

IR2.3 Number of smallholder farmers delivering milk to MCCs	600				850			1100			1350			1600			1600	
IR 2.4 Percentage increase in volume of milk sold by farmers receiving technical assistance	2750 liters per farmer per year				20%			30%			40%			50%			50%	
IR 3: Improved storage of Non-perishable Commodities																		
IR3.2 Increase in commodity receipts used as collateral	0							35%									50%	
IR3.1 Increase in quantity of commodities deposited in certified warehouses	(000) 5 Mt				(000) 50 Mt			(000) 100			(000) 150			(000) 200			(000) 200	
IR3.3 Number of Warehouses certified	4				4			6			8			10			(10)	

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LAND O'LAKES ZAMBIA INC.

DEVELOPMENT ASSISTANCE PROGRAM

BASELINE REPORT SUMMARY

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ZAPE – Zambia Alliance for People and Environment

Summary Report ***October 2004***

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1.0 INTRODUCTION AND OBJECTIVES

1.1 Introduction

Land O'Lakes Inc. in Zambia plans to implement a development program from 2004 to 2008. This program consists of 3 components namely dairy industry development, dairy livestock development and commodity storage and marketing. The program is partly an expansion of existing activities of the Dairy Enterprise Initiative in Zambia and will be implemented in 18 Districts and 6 Provinces in Zambia. These Districts and Provinces are indicated in Table 1.

Table 1: Districts and Provinces to participate in the LOL/ Zambia Development Program

Province	Districts
Central	Kabwe, Chibombo, Mumbwa
Eastern	Chipata, Petauke, Katete
Southern	Choma, Kalomo, Mazabuka, Monze, Kazungula
Copperbelt	Luanshya, Kitwe, Chingola
Western	Mongu, Kaoma
Lusaka Province	Kafue, Chongwe

In conformity with stated priority areas for Title II funding (USAID, 2004) a major objective of the program is to improve household food security among vulnerable populations in Zambia. This will be achieved through increased household income which will enable better access to food.

As an input into a Monitoring and Evaluation System for the program, a set of both monitoring indicators for the 3 components of the program and program food security impact indicators were initially developed. Two food security impact indicators were identified, are contained in an earlier paper (Chuzu, 2004, *Appendix B*) and are: a) months of adequate staple provisioning and b) increase in proportion of households eating at least 3 meals a day. Apart from these impact indicators 14 monitoring indicators were identified for the 3 program components. Monitoring indicators are contained in the Indicator Performance Tracking Table, IPTT (*See Results Report 1.2.1.1, p. 7)*.

In order to determine the starting level of identified indicators against which progress can be measured in future, a baseline survey was conducted in 12

Districts and 8 sites in Zambia in September 2004. This report presents a summary of initial findings of the baseline survey. The final baseline survey report will be submitted to USAID/Lusaka and USAID/Food for Peace in Washington, DC by November 15, 2004.

A. 1.2 Objectives of the Survey

The overall objectives of the baseline survey were threefold:

- To strengthen the Land O'Lakes Development Assistance Program Monitoring and Evaluation plan such that it better reflects the program impact on household food security status of program beneficiaries.
- To provide a more precise definition and understanding of the socio-economic status and vulnerability of program participants; and
- To provide a foundation for the design of a reporting system between implementing agencies and LOL/ Zambia and between LOL/Zambia and AID/DCHA/FFP

Specifically, the study aimed at defining the participants to be targeted by the project and to establish baseline values for monitoring indicators and food security impact indicators.

2.0 METHODOLOGY

The overall methodology was two-pronged and consisted of a formal survey and a participatory rural appraisal.

Quantitative data was collected in a formal survey using a questionnaire. Areas of inquiry in the questionnaire generally aimed at establishing the starting position for the identified indicators relating to the three program components as well as that for the two food security impact indicators. They included assessment of food access throughout the year, access to productive resources including land water and labor, income sources, aspects of livestock and dairy production, milk consumption and sales and level of awareness about the crop warehouse system.

Some questions included in the questionnaire were indicative of the fact that food security might not necessarily result in spite of anticipated income increase because of other related reasons. For example, even with income increase, income control by predominantly men could preclude improvement in the quantity and quality of food consumed. Hence the question about who controls income from various livelihood activities in the household is relevant. Another example is that where physical access to food is difficult, increase in incomes could do little to improve food access. Hence the inquiry about whether staple foods are available for purchase throughout the year.

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Alongside administration of a formal questionnaire, a participatory rural appraisal was conducted in each of the surveyed areas. At least one and at most two PRA exercises were conducted in each surveyed district. The PRAs aimed at complementing the survey questionnaire with more qualitative information. A primary aim of the PRA was to identify vulnerable groups within the communities and the reasons for perceived vulnerability in order to inform the process of targeting for program activities.

Methods employed for the PRA were focus group discussions as well as general group discussions. Group discussions including men and women were used to generate community perceptions about an adequate diet, rank wealth in the community and to outline the labor calendar while the food calendar was pursued with women only focus groups. There was a variation in the way that income control issues were discussed. In the first districts, very susceptible data were obtained when discussing with both men and women together. As a result this approach was changed. Different results were obtained when discussing with the two groups separately. Results from separate groups of men and women seemed to be more reliable than those obtained from the combined group.

2.1 Sampling

As shown in table 1, 18 districts in 6 provinces constitute the sampling universe for the baseline survey. Not all of these districts could be covered due to time and money constraints. Two criteria were used to select 12 districts for survey. A primary consideration in selecting districts for survey was that all agro-ecological zones found in the 18 Districts should be represented. For most rural populations, agro-ecology is a major determinant of the pattern of livelihoods, and socio-economic opportunities and constraints. Districts were first classified into the relevant agro-ecological zones.

Secondly, two districts were selected randomly from each province. The reason for including this geographical consideration is that geo-political factors often impact on vulnerability status in various forms. Some provinces may have better infrastructure and health facilities etc., than others, for example. The World Food Program has in the past performed its vulnerability assessment based on district level data. Some variables used to calculate vulnerability scores are percent population underweight, population within 12 km of a road, months of food aid and deviation (from a nine year cereal production average, cereals include maize, millet sorghum, rice and wheat) in per capita cereal production (Caldwell, 1993).

Given the first consideration that all agro-ecological zones in the 18 universe districts needed to be represented, this implies that where a province contained more than one agro-ecological zone, the districts first had to be grouped under

the various zones and random selection from each zone made. Except for Southern Province each of the other 5 provinces contained at most two agro-ecological zones. In Southern Province Kazungula District was classified separately from other parts of the province because of somewhat different agro-ecology. Table 2 shows the districts selected for the survey and their agro-ecological location.

Table 2: Districts Selected for Survey by Agro-ecological Zone

Province	Selected District	Agro-ecological Zone
Central	Kabwe	Central, Southern and Eastern Plateaus
	Mumbwa	Central, Southern and Eastern Plateaus
Lusaka	Kafue	Luangwa-Zambezi Rift Valley; Central, Southern and Eastern Plateaus
	Chongwe	Luangwa-Zambezi Rift Valley; Central, Southern and Eastern Plateaus
Eastern	Petauke/Chipata	Luangwa-Zambezi Rift Valley; Central, Southern and Eastern Plateaus
	Chipata	Central, Southern and Eastern Plateaus
Copperbelt	Luanshya/ Chingola	Northern High Rainfall Zone
	Chingola	Northern High Rainfall Zone
Western	Kaoma/ Mongu	Western Semi-Arid Plains
	Mongu	Western Semi-Arid Plains
Southern	Monze/ Kalomo	Luangwa-Zambezi Rift Valley; Central, Southern and Eastern Plateaus
Southern	Kazungula	Central, Southern and Eastern Plateaus; Western Semi-Arid Plains

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Sample Size

The number of households to be enumerated per district was calculated according to sampling guidelines by Magnani (1997). In the indicator paper (Chuzu, 2004) 2 food security impact indicators were proposed namely the number of months of adequate staple provisioning and increase in the proportion of households eating at least 3 meals a day. In both cases, there is progress when the proportion of households exhibiting the desired trait, i.e. consuming at least 3 meals a day or with increased months of adequate food provisioning, increases. The number of months of adequate staple provisioning however can also be measured as a mean across a population or sample. In this case an increase in the mean of months of adequate provisioning would signify progress.

The sampling guide provides 2 formulas with regard to sample size for indicators expressed as means and those expressed as proportions. For the baseline survey, the formula for indicators expressed as proportions was used because data that are required to substitute in the alternative formula were not readily available. The formula to calculate sample size for indicators expressed as proportions is given as:

$$n = D\left[(Z_a + Z_b)^2 * (R_1(1-R_1) + R_2(1-R_2)) / (P_2-P_1)^2\right]$$

Where:

- n = minimum sample size per survey round or comparison group
- D = design effect, a default value of 2 is assumed
- P_1 = the estimated level of an indicator measured as a proportion at the time of the first survey
- P_2 = expected level at some future date
- Z_α = the Z-score corresponding to the confidence level with which it is desired to be able to conclude that an observed change of size (P_2-P_1) would not have occurred by chance, α is the level of statistical significance
- Z_β = the Z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size (P_2-P_1) if one actually occurred, β is the statistical power

The estimated baseline levels of both impact indicators were unknown prior to the survey and have been assumed as 0.50. The expected level of the indicators 2 years after the onset of the program and at the mid-term evaluation has been estimated at a minimum of 15%. α and β have been set at the minimum recommended levels of 0.95 and 0.80. Accompanying Z-scores for these levels are 1.645 and .840. Substituting these values into the formula, the total number of households to be sampled works out as follows:

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$n = 2 [(1.645 + 0.840)^2 * (0.5(0.5) + (.65)(.35)) / (.65-.50)^2]$

= 262 (264) households

Adding 10% contingency to this number to compensate for non-responses we get 262 * 1.10 = 288 households. Thus, it was planned to survey 288 households at each survey site or given the 8 survey sites, a total of 2,304 households. In practice, a total of 2,239 households were interviewed. A breakdown of these households per site is given in table 3.

Table 3: Number of Households Surveyed by Province and Site

Province	Site	No of Households Surveyed
Lusaka	Chongwe	286
Eastern	Chipata/ Petauke	299
Central	Kabwe	286
	Mumbwa	255
Southern	Kalomo/ Monze	287
	Kazungula	241
Western	Kaoma/ Mongu	301
Copperbelt	Luanshya/ Chingola	284
Total		2,239

2.2 Selecting Households for Interview

To select the households for interview, a multi-stage cluster sampling procedure was employed. First, all the wards within an estimate 50 kilometer radius of the district center/s were listed and grouped into four clusters according to whether they were located in the north, south, east or west of the district center. In various meetings prior to the survey, it was agreed that 50 kilometer radius was what could reasonably be expected to be covered by the program by the time of the mid-term review. It is planned to expand further out during the later stages of the program. Urban wards were left out of the listing.

From the listing of wards, one ward was randomly selected for enumeration from each cluster of wards. Thus in those sites with one District, 4 wards were selected for enumeration while 8 wards were selected in 2-District sites.

After listing or obtaining a listing of all villages in the selected wards, 3 villages were randomly selected from each ward, resulting in 12 selected villages per site in one-District sites and 24 villages in 2-District sites. From each of the selected

villages, it was planned to interview 24 randomly selected households per village in one-District sites and 12 households per village in 2-District sites. Where available, village household listings were used to effect random household selection. Where no household listings existed, the random walk method was used to select households for interview.

Enumeration teams consisting 5 enumerators and a supervisor per site left for field work on September 13, 2004. Field work was completed on Sunday 26 September, 2004.

3.0 INITIAL FINDINGS

3.1 Staple Food Adequacy

One impact indicator to measure the Land O'Lakes Development Activity Program contribution to household food security is the number of months a household has (in)adequate staples. A decline in the number of months with inadequate staples would signify progress. First, households were asked the type of staples that they consumed in the past 12 months. Table 4 shows the four most important staples in each site.

Table 4: Most Important Staples Consumed in Past 12 Months by Site

Top 4 Staples	Number of Households Consuming	Proportion in Sub-sample Consuming (%)
Chipata/ Petauke (299)		
Maize	291	97
Sweet potatoes	108	36
Cassava	95	32
Rice	50	17
Chongwe (286)		
Maize	268	94
Sweet potatoes	195	68
Cassava	58	20
Rice	29	10
Mongu/ Kaoma (301)		
Maize	291	97
Cassava	258	86

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Top 4 Staples	Number of Households Consuming	Proportion in Sub-sample Consuming (%)
Rice	134	45
Sweet potatoes	116	39
Kalomo/ Monze (287)		
Maize	248	86
Sweet potatoes	122	43
Sorghum	47	16
Cassava	45	16
Kazungula (241)		
Maize	216	90
Sorghum	95	39
Millet	73	30
Cassava	41	17
Mumbwa (255)		
Maize	242	95
Sweet potatoes	103	40
Cassava	70	27
Sorghum	45	18
Kabwe (286)		
Maize	259	91
Sweet potatoes	158	55
Cassava	91	32
Rice	18	6
Luanshya/ Chingola (284)		
Maize	274	96
Cassava	136	48
Sweet potatoes	109	38
Sorghum	26	9

It is evident in table 4 that maize is an important staple in all sites. Except at Monze/Kalomo site where 86 percent of the sub-sample reported having consumed maize in the past 12 months, over 90 percent of the households at other sites had consumed maize. Cassava was important in Mongu/Kaoma site

and consumption of the four top staples was more balanced than at other sites where consumption was concentrated on one or two staples. Sorghum was an important staple in Kazungula District and sweet potatoes in Chongwe District.

3.2 Most Important Source of Staple Foods

The source of most staples consumed was predominantly own production, to varying degrees for different staples. For maize, between 84 and 99 percent of the households in the site sub-samples reported own production as the most important source staples. The proportions were lowest in Kazungula and Kalomo/ Monze Districts where 12 percent each of the households obtained maize from purchases.

In Mongu/ Kaoma Districts where cassava is an important staple, 96 percent of the households sourced it from own production while in Chipata/ Petauke, Kalomo/ Monze, Kazungula and Kabwe Districts between 21 and 34 percent of the households purchased their cassava.

Eighty four percent of those who consume sorghum in Kazungula District produce it. In Kalomo/ Monze Districts 47 percent of those that reported consuming sorghum obtained it as a gift, probably from a relief program.

Sweet potatoes were obtained mostly from own production except in Kazungula District where 48 percent of those consuming them purchased sweet potatoes. In any case sweet potatoes are not an important staple in this District.

3.3 Duration of Staples from Own Production

Households were asked if their own production of various staples lasted up to the next harvest. Table 5 indicates the responses for the four most important staples at each site. Proportions indicated are out of those that reported consuming the particular staple at each site.

Table 5: Proportion (%) of Households with harvests that don't last till next season

	Maize	Sweet Potatoes	Cassava	Rice	Sorghum	Millet
Chipata/ Petauke	74	88	82	96		
Chongwe	60	96	58	100		
Mongu/ Kaoma	83	84	38	90		
Kalomo/ Monze	73	94	79		96	
Kazungula	81		73		88	95
Mumbwa	62	91	82		80	

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Kabwe	30	62	45	71		
Luanshya/ Chingola	31	37	20		50	
Sample Total	61	80	50	90	80	80

Between 30 and 83 percent of those consuming maize in various sites reported running out of maize before the next harvest. The problem was especially serious in Mongu/ Kaoma, Kazungula, Chipata/ Petauke and Monze/ Kalomo Districts where about three quarters and above of all households reportedly normally run out of maize before the next harvest.

It is not surprising that a majority of the households reported running out of sweet potatoes before the next harvest. Sweet potatoes are usually grown on small plots and tend to be seasonal as they are rarely stored.

Apart from maize, cassava is the only other one that was among the four most important staples at all sites. Cassava has the potential to supplement maize when it runs out because it can be stored in the ground and can be harvested when required. In areas where it is preferred, cassava can be used to prepare nshima either by itself or as an additive to maize meal. However, for various households cassava can only mitigate maize shortages if in those households cassava can last up to the next season or if the combination of maize and cassava can tide the household through to the next season. An assessment of quantities required for consumption during the season would be needed to make such a judgment.

The Luanshya/ Chingola site had the lowest proportion of households running out of the four identified main staples as compared to both other sites and the total sample.

When asked about how they filled the staple food gaps from own production, most households (over 50%) at various sites indicated that they purchased food. For Chongwe, Kalomo/Monze, and Kabwe Districts where less than 50 Percent of the households relied on purchases, the most important other ways that households filled food gaps was through barter and gift donation (probably relief).

One way to infer on the changes in household income over time is to study changes in the diet over time. As income rises, households will likely substitute inferior food with other foods. Survey respondents were asked if their households were currently consuming some staples that they did not consume 2 years prior to the study. Additionally, they were asked if they had stopped consuming some staples that they were consuming 2 years prior to the baseline

study. Table 6 shows the number and proportion of households reporting on both aspects.

Table 6: Changes in Staple Consumption Over 2 Years

	Households that are consuming new staples		Households that have dropped old staples	
Site	**Number**	**Proportion in sub-sample**	**Number**	**Proportion in sub-sample**
Chipata/ Petauke	12	4	19	6
Chongwe	9	3	11	4
Mongu/ Kaoma	21	7	25	8
Kalomo/Monze	48	17	53	18
Kazungula	72	30	75	31
Mumbwa	38	15	43	17
Kabwe	12	5	16	6
Luanshya/ Chingola	19	7	25	9

At 3 sites, Kalomo/ Monze, Kazungula and Mumbwa, at least 15 percent of the sub-samples reported consuming new staples they had not been consuming prior to the survey. At Kalomo/ Monze Districts 90 percent of those reporting consumption of new crops had consumed either sorghum or wheat. These staples were most likely accessed as relief food as CARE International was involved in distributing wheat or sorghum for relief. At Kazungula about 80 percent of those that reported consuming new staples in the previous 2 years were consuming rice, cassava, and wheat. Wheat may also have been a relief food while cassava has been recently introduced for cultivation in some parts of the country notably by Program Against Malnutrition (PAM).

Most of those reporting having dropped certain staples in the past 2 years in Kalomo/ Monze had dropped either wheat or sorghum. In Kazungula District, they had dropped cassava, rice or wheat. In Mumbwa District, several crops reportedly had dropped out and none of these crops were predominant. They included rice, cassava, sweet potatoes, wheat and sorghum.

3.5 Perception of an Adequate Diet

During the participatory rural appraisal, communities were asked what they thought constituted an adequate diet. A response that featured prominently is that a household that eats well should have food throughout the year. Further, at all sites communities indicated that an adequate diet consisted of at least 3 meals, a morning meal and 2 main meals, one at or about midday and one in the

evening. The contents of the meals varied according to site and what foods were available by site but the main meal consisted of Nshima and relish accompaniment. Nshima was made from whatever staples were local to the area.

PRA findings tally well with survey findings. In a normal period, not a hungry season, all sites except Luanshya/ Chingola reported consuming at least 3 meals a day (average=2.88 to 3.80). The Luanshya /Chingola average was 2.45. It is also interesting to note that when the data was disaggregated by gender of head of household, female-headed households reported a higher average number of meals consumed in a normal season than their male counterparts in Chipata/ Petauke, Chongwe, Kazungula and Luanshya/ Chingola sites.

Of the main meals reported at all sites, on average about two (1.91) to three (2.63) meals were considered to be main meals. The highest average of main meals per day and the only average higher than 2.50 was found in Monze/ Kalomo site where on average 3 meals (2.63) were considered as main meals.

3.6 Regularity of Meal Consumption Impact Indicator

Table 7 shows sample and site average totals and main meals per day by month, assuming that an adequate diet consists of 3 meals per day, 2 of them being main meals. Main meals per day are indicated in brackets. According to this definition, Chipata/ Petauke, Mongu/ Kaoma and Luanshya/ Chingola sites fell below the average of 3 total meals in all months. At the other sites, there were between 4 and 6 months where the average was above 3 meals. These respondents tended to consume an average of at least 3 meals per day during months immediately following the harvest, which begins some time in March/ April and continuing on to August September or October. Survey findings corroborate those from the PRA that December, January and February are difficult months as concerns food availability.

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Table 7: Sample and Site Average Total Number of Meals and Main Meals per Day, by Month

	Total Sample (N=2239)	Chipata/ Petauke (n=299)	Chongwe (n=286)	Mongu/ Kaoma (n=301)	Kalomo/ Monze (n=287)	Kazungula (n=241)	Mumbwa (n=255)	Kabwe (n=286)	Luanshya/ Chingola (n=284)
2003									
August		2.73 (2.12)	3.10 (2.08)	2.65 (2.32)	2.94 (2.53)	2.50 (1.90)	2.80 (2.01)	3.18 (2.02)	2.38 (1.86)
September		2.65 (2.06)	2.99 (2.07)	2.29 (2.11)	2.82 (2.47)	2.45 (1.87)	2.73 (1.98)	3.15 (2.02)	2.36 (1.85)
October		2.56 (2.03)	2.81 (2.05)	2.05 (1.94)	2.70 (2.40)	2.40 (1.83)	2.65 (1.96)	3.08 (2.00)	2.34 (1.83)
November		2.42 (1.95)	2.48 (1.97)	1.92 (1.78)	2.53 (2.28)	2.28 (1.76)	2.54 (1.89)	2.96 (1.98)	2.13 (1.62)
December		2.29 (1.84)	2.35 (1.90)	1.84 (1.67)	2.39 (2.16)	2.21 (1.70)	2.32 (1.73)	2.85 (1.94)	1.93 (1.47)
2004									
January		1.91 (1.58)	1.88 (1.59)	1.92 (1.71)	2.29 (2.09)	2.23 (1.71)	2.19 (1.63)	2.57 (1.83)	1.86 (1.47)
February		1.74 (1.48)	2.04 (1.60)	2.14 (1.92)	2.43 (2.26)	2.36 (1.79)	2.25 (1.67)	2.62 (1.81)	1.90 (1.56)
March		2.18 (1.70)	3.01 (2.02)	2.43 (2.15)	2.92 (2.53)	2.62 (1.98)	2.86 (2.02)	3.12 (1.99)	2.39 (1.88)
April		2.73 (2.12)	3.19 (2.07)	2.73 (2.38)	3.24 (2.68)	2.71 (2.03)	3.02 (2.11)	3.23 (2.01)	2.47 (1.94)
May		2.84 (2.18)	3.54 (2.15)	2.83 (2.48)	3.36 (2.71)	2.76 (2.07)	3.00 (2.11)	3.26 (2.02)	2.49 (1.95)
June		2.88	3.30	2.83	3.39	2.76	3.01	3.22	2.45

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	Total Sample (N=2239)	Chipata/ Petauke (n=299)	Chongwe (n=286)	Mongu/ Kaoma (n=301)	Kalomo/ Monze (n=287)	Kazungula (n=241)	Mumbwa (n=255)	Kabwe (n=286)	Luanshya/ Chingola (n=284)
		(2.20)	(2.10)	(2.47)	(2.71)	(2.07)	(2.11)	(2.02)	(1.93)
July		2.87 (2.20)	3.29 (2.10)	2.81 (2.46)	3.37 (2.71)	2.74 (2.07)	3.01 (2.12)	3.21 (2.02)	2.45 (1.93)
No of Months with at least 3.00 average		0	6	0	4	0	4	5	0
Proportion (%) h/holds consuming at least 3 meals per day	63	52	74	47	74	57	71	91	37

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3.7 Identification of Food Insecure Target Groups

From the literature certain types of households are known to be particularly vulnerable to food insecurity because of their characteristics. Such households include female-headed households, households with chronically ill members, elderly headed households with productive-age members and households headed by children by youth (C-SAFE, 2003). The reasons for food insecurity in the various cases emanates from a lack of productive resources and or assets (including labor), time constraints because of having to care for the chronically ill, increased dependency ratio as a result of households having to suddenly absorb young orphans or a combination of some of these reasons. These households also featured strongly within the results of the baseline survey as being particularly food insecure.

From the PRA it was found that one common cause of food insecurity among the poorer sections of the community was the inability of these households to break out of the poverty cycle. Most of these households were often preoccupied with how to source food. Even during the farming season and because of lack of food they spent their time looking for piece work on other peoples farms in order to get food. In the meantime, they neglect their own fields such that with poor management they have barely any crop to harvest and are therefore forced to continue offering their labor for petty wages.

In Table 8, households in the sample are characterized according to known food insecure household types. The aim is to examine whether these types of households in the survey sample are worse in terms of food security as compared to the sample averages. In general within all of the sample areas, households containing individuals who were chronically ill, households containing orphans, and households headed by women, were the most food insecure.

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Table 8: Number of Households and Percentages of Households in Food Insecure Groups

Characteristic	Whole Sample	Chipata/ Petauke	Chongwe	Mongu/ Kaoma	Kalomo/ Monze	Kazungula	Mumbwa	Kabwe	Luanshya/ Chingola
Average size of household	6.7	6.2	6.7	7.1	8.1	5.3	6.7	7.0	6.8
Number of households/ (percentage) with chronically ill persons	548 (24)	76 (25)	74 (26)	123 (48)	87 (30)	61 (25)	52 (21)	31 (11)	39 (14)
Number of households/ (percentage) with orphans	925 (41)	93 (31)	140 (49)	178 (60)	128 (45)	99 (41)	106 (43)	80 (28)	101 (36)
Number (percentage) of female-headed households	561 (25)	80 (27)	89 (31)	74 (25)	59 (21)	72 (30)	72 (29)	56 (20)	59 (21)

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4.0 Preliminary Conclusions

Based upon the initial analysis of the results of this survey, utilizing only indicators of food consumption, which are proxies for income, and household access to food, the samples from Mongu/ Kaoma (Western Province), Chipata/ Petauke (Eastern Province), Luanshya/Chingola (Copperbelt Province), Kaloma/ Monze and Kuzungula (Southern Province), appear to indicate the highest degree of food insecurity based on: (a) more than 75% indicate that harvests don't last through the entire year, (b) those sampled currently receive food aid, (c) those sampled report consuming less than three meals per day during all months, or (d) the sample included high percentages of food insecure groups in those areas. Thus, Land O'Lakes Zambia will probably target the associated geographic areas first for interventions. Additional review of the data will confirm this conclusion.

Throughout the program areas, however, Land O'Lakes will focus its efforts upon the identified food insecure target groups: households hosting individuals with chronic illnesses, households containing orphans, and female-headed households. Many food insecure households may not have the resources to devote to purchase and management of dairy cattle and milk production. However, where possible, Land O'Lakes will try to target activities to such households or to community members within the vicinity in the hopes that the presence of livestock and dairy activities in the area will enable others to contribute to those who are unable to support themselves, either through the provision of fresh milk, or through an increased capacity of community members to purchase food.

The data analyzed to date indicates that the baseline value for the **average number of months of adequate food provisioning for the sample surveyed is 9.4 months per year.** In addition, **63% of those sampled throughout the country reported consuming 3 meals per day** (an adequate diet). These are the baseline values for food security indicators for the program.

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REFERENCES

Caldwell, Richard M. 1993. A Preliminary Vulnerability Assessment of Zambia Based on District-Level Data. A report Prepared for the World Food Program and the International Fund for Agricultural Development.

Magnani, Robert. 1997. Sampling Guide. Washington D.C., USA: Food and Nutrition Technical Assistance Project (FANTA), Academy for Educational Development.

USAID. 2004. PL480 TITLE II FY 2005 Development Program Policies.

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Land O'Lakes / Zambia
Title II Development Activity Program
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Food Security Impact Indicators
For Monitoring Performance

Prepared for Land O'Lakes/ZAMBIA
By
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July 2004

APPENDIX B

Introduction

The main purpose of this paper is to suggest some indicators to measure the food security impact of various components of the LOL/Z DAP. These indicators are provisional and may be revised depending on the outcome of discussions with LOL/Z staff and implementing partners, and based on the findings of the planned baseline survey.

Selection of proposed impact indicators was made from food availability and access rather than utilization indicators. Outcomes at the third level of utilization depend on several factors, including health, care and sanitation. The indicators were selected with reference to the stated objectives of the three components of the LOL/Z DAP. These are indicated in table 1. The overall goal of the project is to increase income of smallholder-farmers, dairy processors and rural entrepreneurs.

Indicators in this paper are primarily those that measure impact i.e how the DAP's 3 components might contribute to broad development goals and not those that measure direct output. Impact indicators suggested relate to the program's contribution to household food security. The assumption is that higher income from project activities will result in improved household food security.

Proposed indicators are the same as or variants of indicators that are well documented in the literature and that have been extensively applied in other Title II programs. Indicator selection was based primarily on relevance to the LOL/Z DAP, ease of implementation and cost effectiveness.

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Table 1: Objectives of the 3 Components of the Development Activity Program

Component	Objectives	Goal (Strategic Objective)
Dairy Industry Development	Increased milk sales by smallholder Milk Collection Centers	Increased income of smallholder farmers, dairy processors and rural entrepreneurs
	Increased output of small and medium-scale dairy processors	
Dairy Livestock Development	Increase in milk production by smallholder farmers	
	Increase in milk sales of smallholder farmers	
Storage/ Marketing of Non-Perishable Commodities (NPC's))	Increase number of smallholder farmers using the Warehousing Receipt System	
	Increase in certified storage utilized by smallholder farmers	

IMPACT INDICATORS

1.0 MONTHS OF ADEQUATE STAPLE PROVISIONS

This is a slightly different version of the documented indicator "months of adequate food provisioning". The focus here is on staples because they form the bulk of the diet in most rural situations. Local perception of hunger in most Zambian households is characterized primarily by the inability to source maize meal, cassava or other staple as may be relevant in the area. In rural areas, months of adequate staple provisions are almost always synonymous with the number of months of adequate produced food as most households rely on food that they produce.

In all agro-ecological zones, there is a period, usually during the months between November and February when households have little food. During these months most households have exhausted their food stocks and they have little income to purchase food. For most households, this lean period occurs even during a normal agricultural season but deprivation tends to be more prolonged and deeper in times of weather adversity. Thus, a shortening of the hunger period or a reduction in the number of months without adequate staples would signify progress.

B. 1.1 Data Requirements and Timing

Data required are the number of months with/out adequate staple provisions. Adequacy relates to frequency of main meals as well as the quantity consumed at each sitting. The determination of number of months with/out adequate staple provisioning can be done any time as it will be based on recall. After the baseline survey, the next data collection could be done at the mid-term and final evaluations, assuming that impact of milk sales income will begin to show by the end of the first year.

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C. 1.2 Data Collection Methodology

A representative sample of households should be surveyed to obtain the status at household level, and to obtain an indication of degree of variability within the community.

D. 1.3. Indicator Quality

The indicator is easy and inexpensive to measure.

E. 1.4 Comparability across Agro-ecological Zones

The hunger season differs by its onset and duration across various agro-ecological zones but comparison of the number of months of relative deprivation is easy. Comparison of severity of deprivation, both across zones and between households in specific zones is not possible using only this indicator. This would require additional information quantities consumed.

2.0 INCREASE IN PROPORTION OF HOUSEHOLDS EATING AT LEAST 3 MEALS A DAY

In Zambia a starting point for a family to consider themselves eating well is that they should be eating at least 3 meals a day as follows: breakfast in the morning and 2 main meals namely lunch consisting of a staple and relish; and dinner consisting of a staple and relish. Beyond this, other things to consider are the amount of food available at each of these sittings and the variety in the relish accompaniments. When food is short, rural families sometimes reduce the number of times food is consumed and/ or the quantity consumed at each sitting. For the purpose of construction of this indicator, 3 meals means 2 main meals and any other meal.

F. 2.1 Data Requirements and Timing

Required data are the change in quantity and frequency of meals in the hungry season as compared to a normal period, by household. In order to properly track progress, data should be collected around more or less the same time during the hungry season at the mid-term evaluation and during the final evaluation. Any obvious deviation of the survey year from the norm should be noted.

G. 2.2 Data Collection Methodology

A survey questionnaire will be administered to a representative sample. The indicator comprises a ratio of the number of households consuming at least three meals divided by the total number of households in the sample.

H. 2.3 Indicator Quality

The indicator is easy to measure and inexpensive to implement.

I. 2.4 Comparability Across Agro-ecological Zones

It is assumed that the thumb rule of at least 3 meals a day is well accepted country-wide as a precursor to food adequacy in a household. Differences with respect to perceptions of adequacy of diet might relate more to food content and quantity in the diet rather than

the minimum frequency of meals. The validity of this assumption will be checked through focus group discussions, and the assumption will be revised if and where necessary.

3.0 Gender Concerns

While no indicators have been specifically designed to track gender concerns, suggested indicators can easily be adapted to monitor progress by gender. Care should be taken to include in the monitoring or evaluation samples, strata of vulnerable groups, including female-headed households; and to collect gender disaggregated data where possible. The tracking of participation rates and the accrual of benefits from the program by gender or household headship (whether male- or female-headed) are some opportunities to address gender concerns. In this respect, targets for the achievement of desired gender- (or other vulnerable group) specific goals should be explicitly stated at the outset.

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References

Hoddinott, J. " Choosing Outcome Indicators of Household Food Security." Technical Guide #7. Washington, D.C.: International food Policy Research Institute. 1999.

Land O'Lakes, Inc./Zambia. *Development Activity Program Proposal*. Lusaka: Land O'Lakes, Inc.,/Zambia. 2002.

Swindale, A. and P. Vaschaspati. *Measuring Household Food Consumption: A technical Guide*. Washington, D.C.: Food and Nutrition Technical Assistance, Academy for Educational Development. 1999.

TANGO International, Inc. *Guide for Measuring Food Access.* Washington, D.C.: Food and Nutrition Technical Assistance, Academy for Educational Development. 2004.